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St. Lawrence High School

A JESUIT CHRISTIAN MINORITY INSTITUTION

2nd Examination – 2019

Sub: Arithmetic | **Class: 8** | **F.M: 80**

Duration: 2 Hour 30 minutes | **ANSWER KEY** | **Date: 05. 08. 2019**

Group A

Q1. Select the correct alternative **1 x 5 = 5**

i. *If 80% of x is 256, then the value of x is*
a. 350 b. 300 **c. 320** d. None of these

ii. *Oranges are bought for Rs 3. At what rate per hundred must they be sold to gain 33%*
a.Rs 56 b.Rs 60 c.Rs 57 **d.None of these**

iii. *A single discount equivalent to three successive discount is:*
a.55% b.50% c.48% **d.None of these**

iv. *Area of an equilateral triangle is $4\sqrt{3}$ sq cm. Its perimeter is*
a.12cm b.6 cm c.8 cm d.None of these

v. *The circumference and area of a circle are numerically equal, then the diameter of the circle is equal to*
a. 2 b. π c. 2π **d. None of these**

Q2 Answer the following questions: 1 x 10 = 10

i. *Find the amount 48% of 1 litre*

Ans: 1 l= 1000 ml

Amount = 48 x 1000/100 ml= **480 ml**

ii. *What percent of a day is the time duration of 3 hour?*

Ans: 1 day = 24 hour

Percent of the day = 3/24 x 100% = **12.5%**

iii. *Toffees are bought at the rate of 5 for a rupee and sold at 4 for a rupee. Find the gain per cent.*

Ans: The Cost price (CP) of 5 toffee= Re 1

CP of 1 toffee = Re 1/5 = 20 p

The Selling price (SP) of 4 toffee = Re 1

SP of 1 toffee= Re ¼ = 25 p

Since SP> Cp, there is gain

Gain% = (SP-CP)/CP x 100% = **25%**

iv. *At what time simple interest will be 2/5th of the principal at 8% per annum?*

Ans: Let the Principal (P) be Rs 100

Interest (SI) = 2/5 x 100 = Rs 40

Rate (R) = 8%

Time = (SI x 100)/ (PxR) = 5 **yr**

v. *Find the area of a parallelogram with base 9 cm and the corresponding altitude 5.4 cm.*

Ans: Area of a parallelogram = base x altitude

Base= 9 cm

Altitude = 5.4 cm

Area = 9 cm x 5.4 cm = **48.6 sq cm**

vi. *Find the height of a trapezium, whose sum of lengths of bases is 31 cm and whose area is 124 sq cm.*

Ans: Area of a trapezium = ½ x height x sum of parallel sides

Sum of parallel sides = 31 cm

Area = 124 sq cm

If height = h

124 = ½ x h x 31

Solving for h we have h= **8cm**

vii. *Find the area of a hexagonal table top with each side 2 cm.*

Ans: Area of a regular hexagon = $3\sqrt{3}/2$ x $(\text{side})^2$= $3\sqrt{3}/2$ x $(2)^2$= $6\sqrt{3}$ sq cm or **10.39 sq cm.**

viii. *Find the ratio of area of two circles when the ratio of their radii is 3: 5.*

Ans: Area of a circle = π $(\text{radius})^2$

Ratio of Radii= 3: 5

Ratio of area = $3^2 : 5^2$ =**9: 25**

ix. *What is the mid value of class interval called?* Ans: **Class mark**

x. *What is the graph that represents data as part of a circle called?* Ans: **Pie Chart**

Group B

1. Answer the following questions **2 x 5 = 10**

1.1. The length of a metal rod is 2.4m. When heated the length increases by 2%. Find the new length.

Ans: Original length = 2.4 m.

Increase in length= 2%

New length= 102 x 2.4 m /100 = **2.448 m**

1.2. The price of a concert ticket increases from Rs 60 to Rs 75. Find the percentage increase.

Ans: The original price= Rs 60.

Increased price = Rs 75.

Increase in price= Rs 75 – Rs 60 = Rs 15

Percentage increase = (Increase in price) / (Original price) x 100%= 15/60 x 100% = **25%**

1.3. The simple interest on a sum of 5 years is one fourth the sum. What is the rate of interest per annum?

Ans: Let the Principal (P) be Rs 100
Simple Interest (SI) = Rs 100/4 = Rs 25
Time(T) = 5 years
Rate = (SI x 100)/ (P x T) = (25 x 100)/ (100 x 5) = **5%**

1.4. Two years ago, the value of a machine was Rs 62,500. If its value depreciates by 4% every year, what is its present value?

Ans: Original price (P) = Rs 62500
Rate of depreciation (R) = 4%
Number of years (n) = 2
Present value= $P(1 - R/100)^n = 62500(1 - 4/100)^2$= **Rs 57,600**

1.5. Find the height of a triangle if its area is 24 sq cm and its base is 15 cm.

Ans: Area of a triangle = ½ x base x height

base = 15 cm

Area = 24 sq cm

If height = h

24 = ½ x h x 15

Solving for h we have h= **3.2 cm**

2. Answer the following questions (any 5) **3 x 5 = 15**

2.1. Find the area of an equilateral triangle that has each side 12 cm.

Ans: Area of an equilateral triangle = $\sqrt{3}/4 \times (side)^2 = \sqrt{3}/4 \times (12)^2 = \sqrt{3}/4 \times 144$ = **62.35 sq cm**

2.2. The diameter of a wheel is 98 cm. In how many revolutions will it cover a distance of 1540 m?

Ans: Perimeter of the wheel = π x diameter = π x 98 cm = 308 cm
Distance covered = 1540 m =154000 cm
Number of revolutions = Distance by Perimeter = 154000 308 = **500 revolutions**

2.3. A pie diagram of the marks secured by a student in Maths, English, Physics and Chemistry is shown here in Figure 1. Read the graph and find the marks in Chemistry secured by the student in degrees.

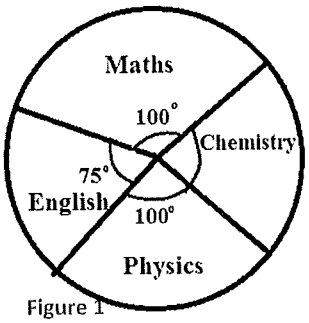


Figure 1

Ans: Marks in Maths = 100^0
Marks in English = 75^0
Marks in Physics = 100^0
Total marks = 360^0
Marks in Chemistry = $360^0 - (100 + 100 + 75)^0 = 360^0 - 275^0 =$ **85^0**

2.4. What is the difference between simple interest and compound interest on Rs 7300 at the rate of 6% per annum in 2 years?

Ans: Principal (P) = Rs 7300
Rate (R)= 6% pa
Time (T)= 2 years
Simple Interest (SI) = P x T x R / 100 = *Rs 876*
Amount for compound interest (A) = $P(1 + R/100)^T = 7300(1 + 6/100)^2$ = Rs 8202.28
Compound interest (CI) = A-P = Rs 8202.28 – Rs 7300 = *Rs 902.28*
Difference = CI – SI = **Rs 26. 28**

2.5. What is the compound interest on Rs 1600 at 20% per annum for 1 year 6 months, compounded half yearly?

Ans: Principal (P) = Rs 1600
Rate (R)= 20% pa compounded half yearly
Time (T)= 1.5 years
Amount for compound interest (A) = $P(1 + R/200)^{2T} = 1600(1 + 10/100)^3$ = Rs 2129.6
Compound interest (CI) = A-P = Rs 2129.6 – Rs 1600 = **Rs 529.6**

2.6. An article was sold for Rs 704 after giving a discount of 12% on its marked price. What is the marked price of the article?

Ans: Selling Price (SP) = Rs 704
Discount = 12%
Let the Marked Price (MP) = Rs 100
Discount = 12% of MP =Rs 12
Selling price = MP- discount = Rs 88
If the SP= Rs 88, MP = Rs 100
If the SP= Re 1, MP = Rs 100/88
If the SP= Rs 704, MP= Rs 100/88 x 704 = **Rs 800**

2.7. If A's income is 50% less than B's income the B's income is what percent more than that of A?

Ans: Let B's income be Rs 100
A's Income = Rs 50
Difference= Rs 50
Required Percentage = (Difference)/(A's Income) x 100% = **100%**

Group – C

(For this group explanation and diagrams are needed where applicable)

Answer the following questions. (Alternatives are to be noted) **8x5=40**

1. *Out of his income, Mr. Raj spends 20% on house rent and 70% of the rest on household expenditure. If he saves Rs. 3600.00 per month, then what is his total income per month?*

Ans: Let the total income be Rs 100
House rent = Rs 20
Remaining amount = Rs 80
Household expenditure = 70% of Rs 80 = Rs 56
Total expenses = Rs 20 + Rs 56 = Rs 76
Total savings = Rs 24
When the savings was Rs 24, Income = Rs 100
When Savings = Re 1, Income = Rs 100/ 24
When Savings = Rs 3600, Income = Rs 100/ 24 x 3600 = **Rs 15000**

2. *A shopkeeper allows a discount of 10% to his customers and still gains 20%. Find the marked price of the article which costs Rs 450.00.*

Ans: Let the Marked Price (MP) = Rs 100
Discount = 10% of MP = Rs 10
Selling Price = MP – discount = Rs 90
Gain = 20% of CP.
CP = 100/ 120 x SP = Rs 75
When CP = Rs 75, MP = Rs 100
When CP = Re 1, MP = Rs 100/75
When CP = Rs 450, MP = Rs 100 / 75 x 450 = **Rs 600**

3. *A man sold a book at a loss of 20%. If he had sold the book for Rs 12.00 more, he would have gained 10%. Find the cost price of the book.*

Ans: Let the Cost Price (CP) = x
Loss = 20% of CP = $x/5$
Selling Price (SP) = CP- loss = $4x/5$
New Selling Price (SP') = $4x/5 + 12$
Gain = SP' – CP = $12 - x/5$
According to the Problem

$$\frac{12 - \frac{x}{5}}{x} = 10\%$$

Solving for x we have x= **Rs 40**

4. *At a certain rate of simple interest, a certain sum of money becomes double of itself in 10 years. In what time will it become treble of itself?*

Ans: Let the Principal be P.
Amount = 2P
Simple Interest (SI) = Amount- Principal = P
Time (T) = 10 years
Rate per annum (R) = (SI x 100)/ (P x T) = (P x 100)/ (P x 10) = 10 %
New Amount = 3P
SI' = 2P
Time (T) = (SI' x 100)/ (P x R)= (2P x 100) / (P x 10) = **20 years.**

5. *The simple interest on a certain sum for 8months at 4% per annum rate is Rs 129.00 less than the simple interest on the same sum for 15months at 5% per annum rate. What is the sum?*

Ans: Let the Principal be P
Rate 1(R1) = 4% pa
Rate 2 (R2) = 5% pa
Time 1 (T1) = 8 months = 2/3 years
Time 2 (T2) = 15 months = 5/4 years

According to the Problem
P x R2 x T12/100 – P x R1 x T1/100 = Rs 129
Or P x 5/4 x 5/100 – P x 2/3 x 4/100 = 129
Solving for P, P= **Rs 3600**

6. *The area of a parallelogram is 98cm^2 and its altitude is twice the corresponding base. Find the altitude of the parallelogram.*

Ans: Area of a Parallelogram = Base x Altitude = 98 sq cm
Let the base be b,
Altitude = 2b (given)
According to the problem,
b x 2 b = 98 sq cm
Solving for b, b= 7 cm. Altitude = **14 cm**

7. *The ratio of the length of the parallel sides of a trapezium is 3:2. The shortest distance between them is 15cm. if the area of the trapezium is 450cm^2, what is the sum of the lengths of the parallel sides?*

Ans: Let the common factor be *x*.
Sum of the length of the parallel sides = $3x + 2x = 5x$
Area of a trapezium = ½ x (sum of parallel sides) x shortest distance between them
Or 450 = ½ x 5*x* x 15
Solving for *x*, *x*= 12
Therefore sum of parallel sides= $5x$ = **60 cm.**

8. *The area enclosed between the circumference of two concentric circles is 16π cm^2 and their radii are in the ratio 5:3. What is the area of the outer circle?*

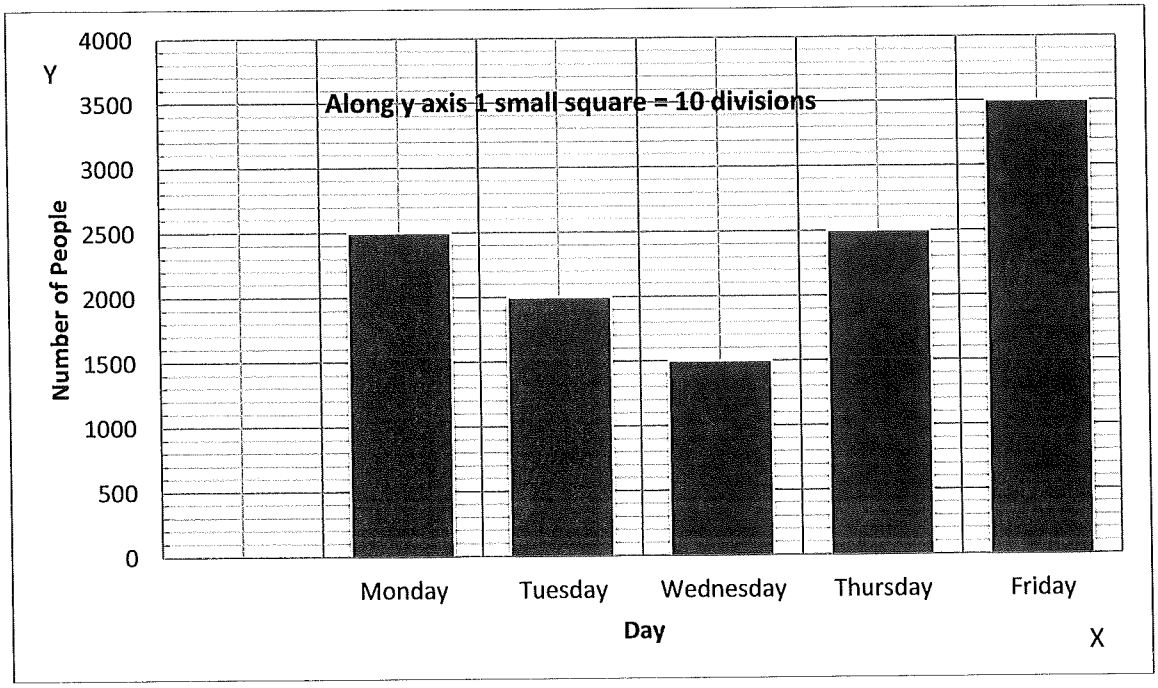
Ans: Let the common factor be r.
Outer radius = 5r
Inner radius = 3r
Area of a circle = π x (radius)^2
Area of annular ring = π x (outer radius)^2- π x (inner radius)^2= 16 π
Or π x[(5r)^2- (3r)^2] = 16 π
Solving, r = 1
Area of outer circle = π x (outer radius)^2= π x (5 x1)^2= **25π**

9. *A circular road runs round a circular ground. If the differences between the circumferences of the outer circle and inner circle is 66metres, find the width of the road.*

Ans: Circumference of a circle = 2 x π x radius.
Let the two radii be R1 and R2
According to the problem
2 x π x R1- 2 x π x R2= 66
Width of the road = R1-R2.
R1- R2 = 66/(2π) = **10.5 m.**

10. *The following table shows the number of people present in a water park on weekdays. Draw a bar graph to represent the above data.*

Day	*Monday*	*Tuesday*	*Wednesday*	*Thursday*	*Friday*
Number of people	*2500*	*2000*	*1500*	*2500*	*3500*


Y
4000
3500
3000
2500
2000
1500
1000
500
0
Number of People
Along y axis 1 small square = 10 divisions
Monday
Tuesday
Wednesday
Thursday
Friday
Day
X